

# WINNING THE WAR ON OBSOLESCENCE

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## Introduction

Claude Shannon, the acclaimed mathematician of the 1930s, once described information as the “reduction of uncertainty.” In the rapidly changing commercial off-the-shelf (COTS) technology environment, obtaining information to combat obsolescence is critical. As acquisition professionals procure the latest technology for insertion into weapon systems, uncertainty cannot be tolerated. This is the story of one office’s journey into the realm of the “reduction of uncertainty.” The resulting lessons learned should be of interest to anyone dealing with technological obsolescence.

## Background

The Joint Tactical Ground Station (JTACS) was developed as a transportable information processing system that provides theater combatant commanders the capability to receive and process satellite threat data on tactical ballistic missile launches. JTACS warns, alerts, and cues the warfighter in real time. JTACS was a joint interest Army/Navy development program managed by the JTACS Product Office headquartered in the Program Executive Office (PEO) for Air and Missile Defense, Huntsville, AL. As JTACS was being designed, thought was already given to future product improvements that would take advantage of changing technologies and doctrine. The cur-

rent JTACS works with Defense Support Program sensors. The Multi-Mission Mobile Processor (M3P), the follow-on to JTACS, will take advantage of the Space Based Infrared System (SBIRS) constellation when deployed. The M3P will be used by the Air Force for strategic mission operations. The M3P will provide improved launch point predictions, trajectory and cueing information, and predicted ground impacts.

Delays in the overall SBIRS Program caused the fielding of the M3P to be delayed almost 2 years from the date originally projected. Cumulatively, this resulted in obsolescence issues affecting the sustainment of JTACS. As such, the JTACS Product Office and its contractor for depot-level logistics support, Northrop Grumman, had to determine the actions necessary to ensure that readiness levels at each JTACS location were not adversely impacted.

## Analysis Process

JTACS Product Office personnel met several times with Northrop Grumman personnel to determine the best approach to resolve issues that were likely to occur as a result of the schedule slip. COTS processors were identified as the most likely items that would be impacted by the schedule delay. In addition, some JTACS system-unique equipment that was commercially adapted could be impacted. Some of these items

had not even been purchased or built since the JTACS fielding in 1997. Failure and usage data were sought to do a prognostic analysis. A survey was also done to determine what companies could still provide spare parts, what suitable substitutes might be available for items no longer produced, and which items might be re-engineered or reverse-engineered. These analysis efforts formed the basis for what would be a two-pronged approach to solving the obsolescence issues now being realized by the JTACS Product Office.

## Solutions

Two approaches were developed. The solution would be dollar-driven, dependent on operations and maintenance (O&M) funding availability. The better but more costly solution was to replace all of the COTS equipment with the latest technology. This approach would ensure that JTACS would meet the requirements to remain in the field until the M3P could be fielded. If another slip in the SBIRS Program should again impact the M3P fielding schedule, the optimal solution could also ensure continued JTACS operational capability and readiness levels beyond just the current 2-year delay. The second option, or “bare-bones” approach, would attempt to maintain JTACS. This approach, with the degree of uncertainty of vendor support and the unpredictability of certain failures resulting from extended operations of the JTACS, was assumed to have a large risk to readiness. Unfunded requirements were identified, then projected and requested through the budget process for O&M. The JTACS Product Office also requested spare equipment from the Attack Launch Early Reporting Theater (ALERT) Program that, at the time this article was written, was scheduled to be deactivated in late 2002.

## Trouble Strikes

The midplane is a COTS JTACS system-unique item. The midplane functions similar to a backplane found in most computer systems. It is the top level in a hierarchical network. During the summer of 2001, a midplane failure occurred. A spare midplane had been initially procured at the same time the midplanes destined for the JTACS had been bought. The spare was installed and the unserviceable midplane returned to the JTACS depot-level contractor. The depot sent the unserviceable midplane to Computer Ruggedization & Integration (CRI) for repair. In the interim, from the time of purchase of the midplane until the first request for repair, the original manufacturer had been bought out by another company and the drawings for the test fixture were missing. Then in March 2002, a second midplane failed, with the potential for lower unit readiness.

A tiger team was formed to address the midplane issue with CRI. The team consisted of JTACS Product Office and Northrop Grumman personnel. The issue was elevated to MG Urias, PEO, Air and Missile Defense, who quickly came onboard with his support for unfunded requirements. Additionally, he wanted CRI to recognize the sense of urgency required to ensure JTACS systems are at their highest readiness rate. The drawings for the test fixture were located shortly thereafter. Northrop Grumman went into action and contracted the building of the test fixture, repair of the two midplanes, and the building of two additional spares to supplement JTACS in the out-years. The midplane has since been repaired and has enhanced JTACS unit readiness.

## Lessons Learned

Throughout this process, the JTACS Product Office learned many

lessons in dealing with obsolescence issues. Some are listed below.

- As soon as a change takes place that extends the life of a fielded system, action is required to assess the impact of the change and budget for any unforeseen requirements necessary to ensure readiness levels and system sustainment.
- Planned technology insertion is required in today's environment of rapidly changing technology.
- Periodic market surveys of vendors who can provide spares for equipment no longer being manufactured are essential.
- Relative to funding, get visibility and support early on from those in leadership positions. Continue to push *hard* for funding.

## Resources

During the process of dealing with obsolescence issues, a number of organizations were identified that may be of use to other program management personnel trying to resolve obsolescence problems:

*The Manufacturing Science and Technology Division within the U.S. Army Aviation and Missile Research, Development and Engineering Center (AMRDEC).* Its focus is on obsolescence management capabilities and services. Some of the services AMRDEC provides are as follows: rapid-response locating of residual obsolete components; comprehensive obsolescence management risk assessments; program parts selection; component availability projection; projected obsolescence resolution sustainment costs for out-year budgeting; and solution recommendations, cost analysis, and implementation plans. AMRDEC can be reached by e-mail at [obsolescence@rdec.redstone.army.mil](mailto:obsolescence@rdec.redstone.army.mil).

*Letterkenny Army Depot (LEAD).* LEAD works on electronic systems integration, wiring harnesses, fiber-

optic cables, and military standard soldering. It also repairs and tests multiple-layer circuit boards down through three layers. To do business with LEAD, contact James Goins, LEAD Liaison Officer at (256) 876-0410, DSN 746-0410, or by e-mail at [james.goins@redstone.army.mil](mailto:james.goins@redstone.army.mil).

*Tobyhanna Army Depot (TYAD).* TYAD offers the capability to reverse-engineer printed wiring assemblies (PWAs), both double-sided and multilayer boards. If requested, a full technical data package (TDP) can be developed from the effort. Once developed, the TDP can be used to procure PWAs from commercial sources or be supplied by Tobyhanna in small quantities.

Because of system obsolescence and downsizing, production quantities for most systems are decreasing. Inventory levels for spares are also decreasing to accommodate the upgrade to the newest technology. Just-in-time manufacturing practices used at Tobyhanna for low-production runs eliminate the burden of having to keep excess, obsolete, or soon-to-be-obsolete parts sitting on the shelf. To do business with TYAD, contact Frank Estock at (570) 895-7089, DSN 795-7090, or by e-mail at [Frank.Estock@tobyhanna.army.mil](mailto:Frank.Estock@tobyhanna.army.mil).

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